Developing Numeric Nutrient Criteria for Mississippi

Stakeholder Update

MDEQ Amite Street Offices
Jackson, MS
November 28, 2012

Criteria are required by law

- Water quality standards (WQS) are required by the Clean Water Act for waterbodies in MS
  - A water quality standard = A designated use + **criteria** to protect the use + policy to prevent degradation
  - MDEQ has many criteria to protect designated uses from different pollutants

Water Quality Criteria

- A concentration, level, or narrative statement
- Represent a level of water quality that supports a particular designated use
- States must adopt criteria that protect the designated use(s)
  - Based on a sound, scientific rationale
  - Sufficient parameters to protect the designated use
  - Must support the most sensitive use

Nutrient Criteria

- Nutrients are a major pollutant contributing to impairment of waters nationwide

- EPA developed an Action Plan for nutrients in 2001 that included states developing numeric nutrient criteria to protect uses from nutrient pollution

- MDEQ developed a task force and a plan for developing nutrient criteria

- MDEQ's Mission:

  Develop appropriate and protective numeric nutrient criteria for Mississippi's waters that are scientifically defensible.

MS Nutrient Task Force

- Decided that criteria should be developed based on water body type
  - Lakes and Reservoirs
  - Streams and Rivers
  - Estuaries and Coastal Waters
- Established different committees to focus on different water body types
- Developed the first Nutrient Criteria Development Plan for Mississippi

Implementing Our Plan

- Took action on the Task Force's recommendations
- Data and information gaps were identified by the Task Force
- Efforts were initiated to address these gaps
  - Data collection across various water body types
  - Establishing biological indicators
  - Preliminary nutrient criteria analyses

Data Collection Efforts

- Data collection efforts have been underway to fill data and information gaps
- On-going MDEQ-Led Data Collection Efforts
  - Data collection efforts in all water body types across the state
  - Awarded EPA GMPO grant for intensive nutrient study of St. Louis Bay watershed
  - Continued sampling of benthic macroinvertebrate communities within wadeable streams throughout the state (M-BISQ)
  - Sampling of benthic communities and DO data within Delta waters
  - 319/BMA Projects

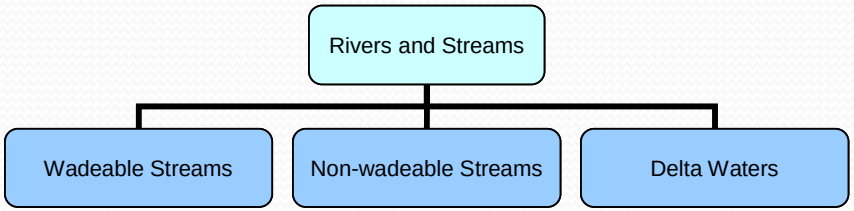
Tool Development

- MDEQ is developing/evaluating multiple tools in an attempt to make the connection between nutrient concentrations and biological response
  - M-BISQ Recalibration
  - Trophic State Index (TSI) for Lakes
  - Benthic Index for Coastal Waters
  - Benthic Index for Delta Waters
  - Fish IBI for Delta waters

Timeline

- System-wide approach to criteria development to ensure protection of downstream uses

- Public Comment Period Begins by June 30, 2013
  - Lakes and Reservoirs
  - Wadeable Streams
  - Non-wadeable Streams
  - Coastal and Estuarine Waters



- Public Comment Period Begins by November 30, 2014
  - Delta Waters

MDEQ Nutrient Technical Advisory Group

- MDEQ is committed to a defensible, science driven process for deriving protective criteria

- At the core of this process is the input, review, and guidance of technical work by a committee of state and federal agency scientists with technical expertise relevant to nutrient science

- MDEQ formed the Nutrient TAG to be this committee

- TAG's Mission:

  Provide technical expertise and regional knowledge to MDEQ for the development of scientifically defensible numeric nutrient criteria.

MDEQ Nutrient Technical Advisory Group

GULF COAST
RESEARCH LABORATORY
THE UNIVERSITY OF SOUTHERN MISSISSIPPI

United States Department Of Agriculture
Agricultural Research Service

Nutrient Criteria Analysis

- Goal: scientifically defensible, protective criteria developed using a transparent, well-documented process

- Methods based on USEPA Nutrient Criteria Guidance
  - Data Compilation
  - Classification of Waters
  - Data Analysis using Multiple Lines of Evidence
  - Criteria Derivation

Data Analysis: Multiple Lines of Evidence

- Using multiple lines of analysis to define a specific endpoint
- Alternative to single analysis approaches
- Especially useful with complex systems

"A weight of evidence approach that combines any or all of the three approaches above will produce criteria of greater scientific validity"

-USEPA 2000, SAB 2010

Lines of Evidence

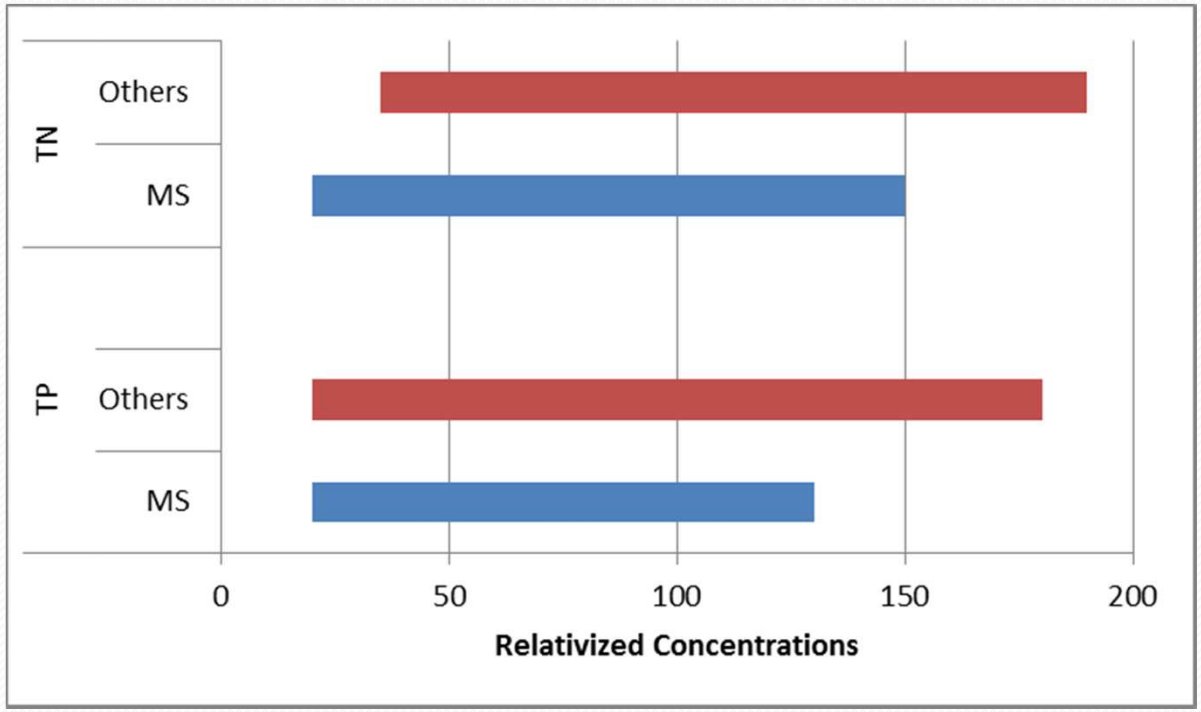
- Distributions of nutrient values in minimally disturbed sites and sites attaining uses
- Stressor-response empirical models of nutrients versus biological/chemical responses
- Mechanistic water quality model output
- Scientific literature on nutrient effects

Preliminary Results: Non-Delta Streams/Rivers

- Distribution, stressor-response, scientific literature
- TP Range: 0.020 – 0.130 mg/L
- TN Range: 0.200 – 1.500 mg/L
- Analytical reports completed and available for review

Preliminary Results: Non-Delta Streams/Rivers

- Ranges consistent with those adopted in other states for comparable waters



Preliminary Results: Non-Delta Reservoirs/Oxbows

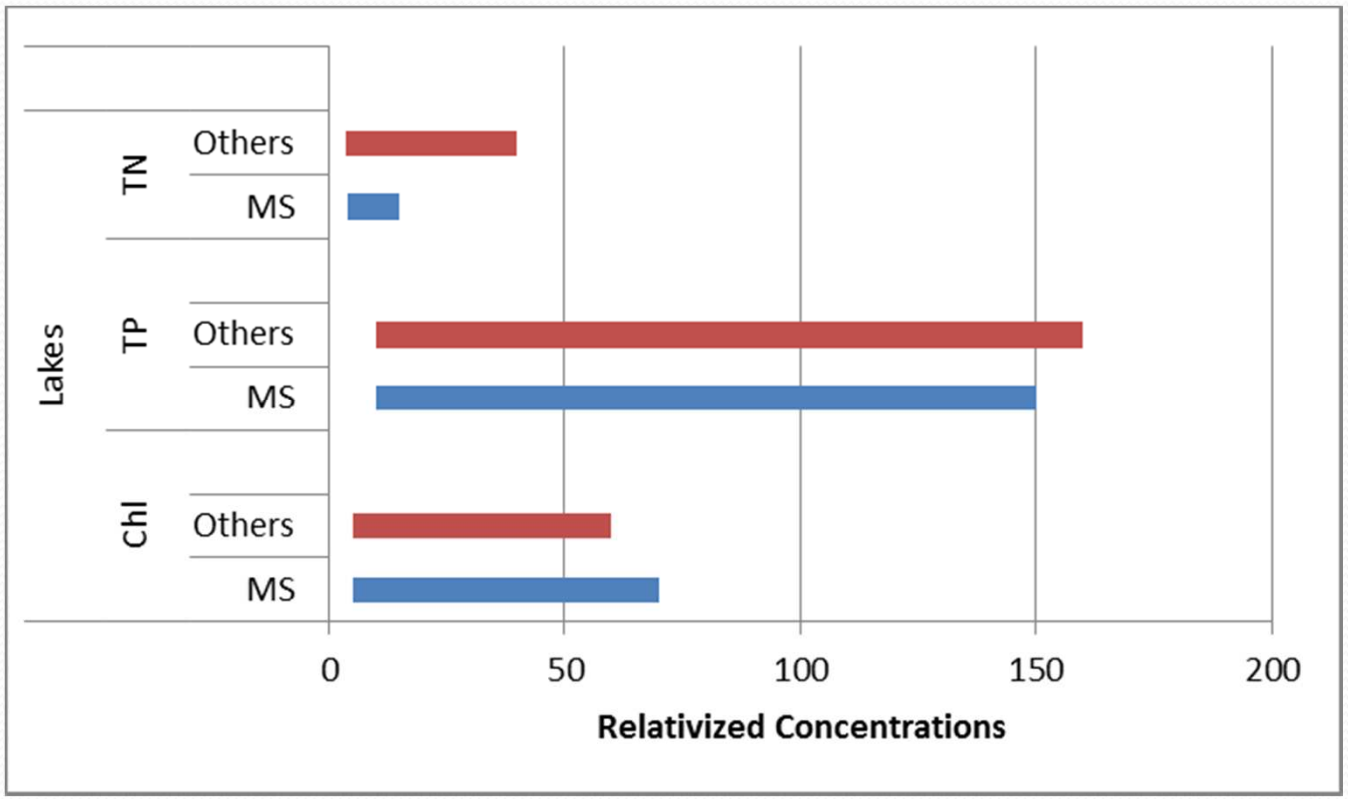
- Stressor-response, scientific literature

- Chl a: 5 - 70 ug/L
- TP Range: 0.010 – 0.150 mg/L
- TN Range: 0.400 – 1.500 mg/L

- Analytical reports completed and available for review

Preliminary Results: Non-Delta Reservoirs/Oxbows

- Ranges consistent with those adopted in other states for comparable waters



Preliminary Results: Coastal/Estuary

- Distribution, stressor-response, mechanistic models, scientific literature

- Still very preliminary

- Chl a: 2 - 20 ug/L
- TP Range: 0.020 – 0.200 mg/L
- TN Range: 0.300 – 1.000 mg/L

- Ongoing data analyses
- Ongoing mechanistic modeling of Saint Louis Bay
- Development of a MS Coastal Benthic Index is underway
- Analytical report being drafted

Preliminary Results: Delta Waters

- Modeled reference, stressor-response, mechanistic models, scientific literature
- Very early in process
- TAG meeting yesterday (November 27, 2012)
  - Data Compilation – identifying additional data
  - Classification – big issue of hydrologic modification
  - Preliminary Analysis – promising relationships with oxygen
  - Biological response indicator in development – Delta BISQ
    - Will be used in analyzing responses

Beyond the Number: Implementation

- We (MDEQ) heard your concerns with regards to implementation…

- Actively working on:
  - Permitting implications
  - Assessment implications
  - Compliance Schedules
  - Variances/Mixing Zones/Others

Beyond the Number: Implementation

- MDEQ with guidance from the TAG will work through questions such as:
  - How will the number be written into our standards?
  - How will we monitor for nutrients?
  - How will we assess for nutrients?
  - How will we incorporate this number into permits?
  - How long will facilities have to comply with new permit limits?
  - And other questions this stakeholder group may have – so please send them along.

Moving Forward in MS

- MDEQ will continue work through the criteria development process with TAG support
- Following the mutually-agreed upon timeline in the Nutrient Criteria Development Plan
- Next TAG meeting: January 2013
- Stakeholder Outreach an MDEQ Priority
  - Will continue throughout the criteria development process
  - Opportunity for stakeholders to stay informed and also provide comments and/or concerns regarding criteria development efforts
  - Feedback will help us strengthen our analyses and improve the overall process

Questions?
Comments?
Concerns?